Attorney's Docket No. 9259-2 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Bares et al.
Serial No.: 10/076,963
Filed: February 15, 2002
Confirmation No.: 1465
Group Art Unit: 2626
Examiner: Myriam Pierre
For: METHODS, SYSTEMS, AND COMPUTER PROGRAM PRODUCTS FOR PROVIDING AUTOMATED CUSTOMER SERVICE VIA AN INTELLIGENT VIRTUAL AGENT THAT IS TRAINED USING CUSTOMER-AGENT CONVERSATIONS

Date: September 19, 2006

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CERTIFICATION OF ELECTRONIC TRANSMISSION UNDER 37 CFR § 1.8
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Erin A. Campion

TRANSMITTAL OF APPEAL BRIEF
(PATENT APPLICATION--37 C.F.R. § 41.37)

1. Transmitted herewith is the APPEAL BRIEF for the above-identified application, pursuant to the "Notice of Appeal to the Board of Patent Appeals and Interferences" filed July 17, 2006 and received in the U. S. Patent and Trademark Office July 19, 2006.

2. This application is filed on behalf of
☐ a small entity.

3. Pursuant to 37 C.F.R. § 41.20(b)(2), the fee for filing the Appeal Brief is:

☐	small entity	$250.00
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Appeal Brief fee due **$500.00**

☒ This and any additional fee or refund may be charged to Deposit Account No. 50-0220.

Respectfully submitted,

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APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. §41.37

Sir:

This Appeal Brief is filed pursuant to the "Notice of Appeal to the Board of Patent Appeals and Interferences" filed July 17, 2006 and received in the U. S. Patent and Trademark Office July 19, 2006.

Real Party In Interest

The real party in interest is assignee LiveWire Logic, Inc., Morrisville, California.

Related Appeals and Interferences

Appellants are aware of no appeals or interferences that would be affected by the present appeal.

Status of Claims

Appellants appeal the rejection of Claims 1 - 66, which as of the filing date of this Brief remain under consideration. Claims 1 - 66 stand rejected. Appellants submit that the claims involved in the appeal are Claims 1 - 66 as a reversal of the rejection of independent Claims 1, 17, 23, 39, 45, and 61 is requested in the present appeal and a reversal of the rejection of dependent Claims 2 - 16, 18 - 22, 24 - 38, 40 - 44, 46 - 60, and 62 - 66 is also requested based on the reversal of the rejection of the independent claims. Accordingly, Claims 1 - 66 as included in Appellants' response to the Office Action of November 3, 2005 are attached hereto as Appendix A.

Status of Amendments

No responses after final rejection have been filed in the present case.

Summary of Claimed Subject Matter

Independent Claim 1 is directed to a method of responding to a customer communication comprising receiving an utterance from the customer at an agent executing on a data processing system (block 112 of FIG. 4), generating a response to the utterance received from the customer at the agent (IVA program 94 of FIG. 3) based on a knowledge base (knowledge base 92 of FIG. 3) that comprises information extracted from at least one exemplary conversation, wherein the at least one exemplary conversation comprises an exchange of utterances (block 114 of FIG. 4), and sending the response from the agent to the customer (response engine 104 of FIG. 3; block 116 of FIG. 4) (Specification, page 11, lines 14 - 27).

Independent Claim 17 is directed to a method of training an agent to respond to a customer communication comprising compiling at least one exemplary conversation (block 192 of FIG. 11), wherein the at least one exemplary conversation comprises an exchange of utterances, annotating the compiled at least one conversation to categorize information contained therein (conversation annotator module 102 of FIG. 3; block 194 of FIG. 11), and processing the annotated at least one conversation using a machine learning engine (machine learning program 88 of FIG. 3) to populate a knowledge base (knowledge base 92 of FIG. 3) for use by the agent

in generating a response to the customer communication (block 196 of FIG. 11) (Specification, page 14, lines 10 - 24).

Independent Claim 23 is directed to a system for responding to a customer communication comprising means for receiving (communication program module 82 and IVA program module 94 of FIG. 3; block 112 of FIG. 4) an utterance from the customer at an agent executing on a data processing system, means for generating a response to the utterance received from the customer at the agent (IVA program module 94 of FIG. 3) based on a knowledge base (knowledge base 92 of FIG. 3) that comprises information extracted from at least one exemplary conversation, wherein the at least one exemplary conversation comprises an exchange of utterances, and means for sending the response (response engine 104 of FIG. 3; block 116 of FIG. 4) from the agent to the customer. (Specification, page 11, lines 14 - 27). The communication program module 82, IVA program module 94, processor 72, and memory 74 of FIG. 3 provide structure for the means for receiving. The IVA program 94, the processor 72, and the memory 74 provide structure for the means for generating.

Independent Claim 39 is directed to a system for training an agent to respond to a customer communication comprising means for compiling at least one exemplary conversation (block 192 of FIG. 11), wherein the at least one exemplary conversation comprises an exchange of utterances, means for annotating the compiled at least one conversation to categorize information contained therein (conversation annotator module 102 of FIG. 3; block 194 of FIG. 11), and means for processing the annotated at least one conversation using a machine learning engine (machine learning program 88 of FIG. 3) to populate a knowledge base (knowledge base 92 of FIG. 3) for use by the agent in generating a response to the customer communication (block 196 of FIG. 11) (Specification, page 14, lines 10 - 24). The conversation log 98, processor 72, and memory 74 of FIG. 3 provide structure for the means for compiling. The conversation annotator module 102, processor 72, and memory 74 of FIG. 3 provide structure for the means for annotating. The machine learning program 88, processor 72, and memory 74 of FIG. 3 provide structure for the means for processing.

Independent Claim 45 is directed to a computer program product for responding to a customer communication comprising a computer readable storage medium (memory 74 of FIG. 3) having computer readable program code embodied therein. The computer readable program

code comprises computer readable program code for receiving an utterance from the customer at an agent executing on a data processing system (block 112 of FIG. 4), computer readable program code for generating a response to the utterance received from the customer at the agent (IVA program 94 of FIG. 3) based on a knowledge base (knowledge base 92 of FIG. 3) that comprises information extracted from at least one exemplary conversation, wherein the at least one exemplary conversation comprises an exchange of utterances (block 114 of FIG. 4), and computer readable program code for sending the response from the agent to the customer (response engine 104 of FIG. 3; block 116 of FIG. 4) (Specification, page 11, lines 14 - 27).

Independent Claim 61 is directed to a computer program product for training an agent to respond to a customer communication comprising a computer readable storage medium (memory 74 of FIG. 3) having computer readable program code embodied therein. The computer readable program code comprises computer readable program code for compiling at least one exemplary conversation (block 192 of FIG. 11), wherein the at least one exemplary conversation comprises an exchange of utterances, computer readable program code for annotating the compiled at least one conversation to categorize information contained therein (conversation annotator module 102 of FIG. 3; block 194 of FIG. 11), and computer readable program code for processing the annotated at least one conversation using a machine learning engine (machine learning program 88 of FIG. 3) to populate a knowledge base (knowledge base 92 of FIG. 3) for use by the agent in generating a response to the customer communication (block 196 of FIG. 11) (Specification, page 14, lines 10 - 24).

Dependent Claim 29 is directed to a system for responding to a customer communication comprising means for receiving (communication program module 82 and IVA program module 94 of FIG. 3; block 112 of FIG. 4) an utterance from the customer at an agent executing on a data processing system, means for generating a response to the utterance received from the customer at the agent (IVA program 94 of FIG. 4) based on a knowledge base (knowledge base 92 of FIG. 3) that comprises information extracted from at least one exemplary conversation, wherein the at least one exemplary conversation comprises an exchange of utterances, and means for sending the response (response engine 104 of FIG. 3; block 116 of FIG. 4) from the agent to the customer. (Specification, page 11, lines 14 - 27). The means for generating the response to the utterance received from the customer comprises means for analyzing the utterance (natural

language program 96 and natural language understander module 106 of FIG. 3 and block 122 of FIG. 5) received from the customer based on at least one of the following: at least one prior utterance received from the customer, at least one prior response sent from the agent to the customer, and the knowledge base that comprises the information extracted from the at least one exemplary conversation. (Specification, page 11, line 28 - page 12, line 6). The means for analyzing the utterance received from the customer comprises at least one of the following: means for recognizing the utterance (natural language understander module 106 of FIG. 3) received from the customer based on the knowledge base that comprises the information extracted from the at least one exemplary conversation; and means for recognizing a part of the utterance (natural language understander module 106 of FIG. 3) received from the customer based on the knowledge base that comprises the information extracted from the at least one exemplary conversation. (Specification, page 12, lines 7 - 17). The means for recognizing the utterance received from the customer comprises means for associating the utterance (natural language understander module 106 of FIG. 3) received from the customer with an information type that corresponds to at least one of a predefined information arrangement and a predefined information meaning. (Specification, page 12, lines 7 - 17). The communication program module 82, IVA program module 94, processor 72, and memory 74 of FIG. 3 provide structure for the means for receiving. The IVA program 94, the processor 72, and the memory 74 provide structure for the means for generating. The natural language program 96, natural language understander module 106 of FIG. 3, processor 72, and memory 74 of FIG. 3 provide structure for the means for analyzing. The natural language understander module 106, processor 72, and memory 74 of FIG. 3 provide structure for the means for recognizing the utterance, the means for recognizing a part of the utterance, and the means for associating the utterance.

Dependent Claim 37 is directed to a system for responding to a customer communication comprising means for receiving (communication program module 82 and IVA program module 94 of FIG. 3; block 112 of FIG. 4) an utterance from the customer at an agent executing on a data processing system, means for generating a response to the utterance received from the customer at the agent (IVA program 94 module of FIG. 3) based on a knowledge base (knowledge base 92 of FIG. 3) that comprises information extracted from at least one exemplary conversation, wherein the at least one exemplary conversation comprises an exchange of utterances, and means

for sending the response (response engine 104 of FIG. 3; block 116 of FIG. 4) from the agent to the customer (Specification, page 11, lines 14 - 27), means for recording the utterance (IVA program 94 of FIG. 3; block 182 of FIG. 10) received from the customer and the response sent from the agent to the customer in a conversation log, means for reviewing (data processing system 24 of FIG. 1; block 184 of FIG. 10) the conversation log to determine if the agent sent an improper response to the customer, and means for editing (data processing system 24 of FIG. 1; block 184 of FIG. 10) the conversation log to correct the improper response if the agent sent the improper response to the customer. (Specification, page 13, line 30 - page 14, line 9). The communication program module 82, IVA program module 94, processor 72, and memory 74 of FIG. 3 provide structure for the means for receiving. The IVA program 94, the processor 72, and the memory 74 provide structure for the means for generating. The IVA program 94, the processor 72, and the memory 74 provide structure fore the means for recording. The data processing system 24 provides structure for the means for reviewing and the means for editing.

Grounds of Rejection to be Reviewed on Appeal

Claims 1 - 6, 8 - 14, 16 - 28, 30 - 36, 38 - 50, 52 - 58, and 60 - 66 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U. S. Patent Application Publication 2001/0049688 to Fratkina et al. (hereinafter "Fratkina") in view of U. S. Patent No. 6,751,591 to Gorin et al. (hereinafter "Gorin").

Dependent Claims 7, 15, 29, 37, 51, and 59 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Fratkina in view of Gorin and further in view of U. S. Patent No. 6,711,585 to Copperman et al. (hereinafter "Copperman").

Argument

I. Introduction to 35 U.S.C. §103 Analysis

A determination under §103 that an invention would have been obvious to someone of ordinary skill in the art is a conclusion of law based on fact. *Panduit Corp. v. Dennison Mfg. Co.* 810 F.2d 1593, 1 U.S.P.Q.2d 1593 (Fed. Cir. 1987), *cert. denied*, 107 S.Ct. 2187. After the involved facts are determined, the decision maker must then make the legal determination of

whether the claimed invention as a whole would have been obvious to a person having ordinary skill in the art at the time the invention was unknown, and just before it was made. *Id.* at 1596. The United States Patent and Trademark Office (USPTO) has the initial burden under §103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988).

To establish a prima facie case of obviousness, the prior art reference or references when combined must teach or suggest *all* the recitations of the claims, and there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. M.P.E.P. §2143. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. M.P.E.P. §2143.01, citing *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990). As emphasized by the Court of Appeals for the Federal Circuit, to support combining references, evidence of a suggestion, teaching, or motivation to combine must be **clear and particular**, and this requirement for clear and particular evidence is not met by broad and conclusory statements about the teachings of references. *In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). In another decision, the Court of Appeals for the Federal Circuit has stated that, to support combining or modifying references, there must be **particular** evidence from the prior art as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed. *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000).

Appellants respectfully submit that the pending independent claims are patentable over the cited references for at least the reason that the cited references do not disclose or suggest, either alone or in combination, each of the recitations of the independent claims. The patentability of the pending claims is discussed in detail hereinafter.

A. Claims 1 - 6, 8 - 14, 16 - 28, 30 - 36, 38 - 50, 52 - 58, and 60 - 66 are Patentable

Independent Claims 1, 17, 23, 39, 45, and 61 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Fratkina in view of Gorin. (April 17, 2006 Final Office Action

(hereinafter "Final Action", pages 3 and 12). Independent Claim 1 is directed to a method of responding to a customer communication that recites, in part:

> ...
> generating a response to the utterance received from the customer at the agent based on a knowledge base that comprises information extracted from at least one exemplary conversation, wherein the at least one exemplary conversation comprises an exchange of utterances; and
> ... (emphasis added).

Independent Claim 17 is directed to a method of training an agent to respond to a customer communication that recites:

> compiling at least one exemplary conversation, wherein the at least one exemplary conversation comprises an exchange of utterances;
> annotating the compiled at least one conversation to categorize information contained therein;
> processing the annotated at least one conversation using a machine learning engine to populate a knowledge base for use by the agent in generating a response to the customer communication. (Emphasis added).

Independent Claims 23, 39, 45, and 61 include similar recitations. Thus, according to independent Claim 1 a response is generated at the agent based on a knowledge base that includes information generated from one or more conversations. According to independent Claim 17, an agent is trained by compiling one or more exemplary conversations, annotating the compiled conversation(s), and processing the annotated converstion(s) to populate a knowledge base for use by the agent in generating a response to the customer communication.

In sharp contrast, Fratkina describes a system that attempts to model interaction between a machine and a human being in the way that people interact with one another. (Fratkina, paragraph 13). In this regard, Fratkina describes the computer system prompting the user with questions to obtain more information with respect to a particular problem/question. (Fratkina, paragraphs 13, 384, and 385). Appellants further acknowledge that Fratkina describes the use of a knowledge map 234 (*see*, Fratkina FIG. 3). Appellants note, however, that Fratkina appears to contain no teaching or suggestion that the knowledge map 234 be populated with information generated from one or more conversations. The Final Action acknowledges that Fratkina does

not disclose or suggest a knowledge base that is populated with information based on one or more exemplary conversations involving an exchange of utterances, but alleges that Gorin provides the missing teachings. (Final Action, pages 3 and 12).

Appellants respectfully disagree. Appellants acknowledge that Gorin describes a system in which previous conversations are stored in a dialog history database 170. (Gorin, col. 4, lines 3 - 5). In the "Response to Arguments" section of the Final Action, it is alleged that Appellants have argued that Gorin does not use the conversations stored in the dialog history database 170. This is a misstatement of Appellants' argument. In sharp contrast to the recitations of independent Claim 1, **Appellants submit that Gorin does not use the conversations stored in the dialog history database 170 to generate a response to an utterance received from a customer at an agent**. Instead, Gorin makes use of a Natural Language Understanding (NLU) monitor that is configured to monitor a dialog and, using a training database 165 and the dialog history database 170, to predict whether the dialog will result in an NLU error. Gorin explains this as follows:

> In the natural language understanding monitoring system 100, the dialog history database 170 serves as a database for storing each dialog exchange for a particular dialog. The training database 165 stores NLU errors collected from interactions with human users and models built based on those errors, the NLU features identified from the collected dialogs, and the NLU rules generated from the dialogs and the NLU features. The NLU monitor 180 exploits the training database 165 by using the dialog history stored in the dialog history database 170 to predict whether a NLU error is to occur in the current dialog. While the training database 165 and the dialog history database 170 are shown as separate databases in the exemplary embodiments, the dialog history and training data may be stored in the same database or memory, for example. This database or memory may be stored external or internal to the system. (Gorin, col. 4, lines - 18).

Thus, Appellants submit that even if Gorin were to be combined with Fratkina, the combination does not describe or suggest, at least, generating a response to an utterance received from a customer at an agent based on a knowledge base that comprises information extracted from one or more exemplary conversations as recited in independent Claim 1 or populating a knowledge base with one or more annotated conversations for use by the agent in generating a response to the customer communication as recited in independent Claim 17. By adding the

teachings of Gorin to Fratkina's system for modeling interaction between a machine and a human being, the resulting system may have the capability of estimating when a particular dialog between a machine and a human may result in an NLU error. The combination does not, however, provide any teaching or suggestion of using stored conversations to generate the responses that are provided by the machine to the human user.

For at least the foregoing reasons, Appellants submit independent Claims 1, 17, 23, 39, 45, and 61 are patentable over the cited references and that dependent Claims 2 - 16, 18 - 22, 24 - 38, 40 - 44, 46 - 60, and 62 - 66 are patentable at least by virtue of their depending from an allowable claim. Accordingly, Appellants respectfully request that the rejection of Claims 1 - 6, 8 - 14, 16 - 28, 30 - 36, 38 - 50, 52 - 58, and 60 - 66 be reversed based on the failure of the Examiner to establish a prima facie case of obviousness under 35 U.S.C. §103 for at least these reasons.

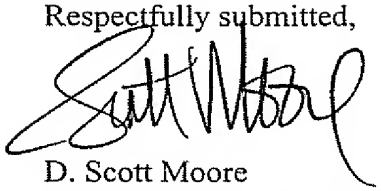
B. Dependent Claims 7, 15, 29, 37, 51, and 59 are Patentable

Dependent Claims 7, 15, 29, 37, 51, and 59 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Fratkina in view of Gorin and further in view of U. S. Patent No. 6,711,585 to Copperman et al. (hereinafter "Copperman"). (Final Action page 10). Dependent Claims 7, 15, 29, 37, 51, and 59 depend from independent Claims 1, 23, and 45 which Appellant submits are patentable for at least the reasons discussed above in Section IA. Appellants submit that dependent Claims 7, 15, 29, 37, 51, and 59 are patentable over the cited references at least by virtue of their depending from an allowable claim. *Ex parte Ligh*, 159 U.S.P.Q. (BNA) 61, 62 (Bd. App. 1967). Accordingly, Appellants respectfully request that the rejection of dependent Claims 7, 15, 29, 37, 51, and 59 be reversed based on the failure of the Examiner to establish a prima facie case of obviousness under 35 U.S.C. §103 for at least these reasons.

II. Conclusion

In summary, Appellants respectfully submit that, with respect to Claims 1 - 66, the cited references do not teach all of the recitations of the claims for at least the reasons discussed above. Accordingly, Appellants respectfully request reversal of the rejection of Claims Dependent Claims 1-66 based on the cited references.

Respectfully submitted,



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APPENDIX A

1. (Original) A method of responding to a customer communication, comprising:

receiving an utterance from the customer at an agent executing on a data processing system;

generating a response to the utterance received from the customer at the agent based on a knowledge base that comprises information extracted from at least one exemplary conversation, wherein the at least one exemplary conversation comprises an exchange of utterances; and

sending the response from the agent to the customer.

2. (Original) A method as recited in Claim 1, wherein generating the response to the utterance received from the customer comprises:

analyzing the utterance received from the customer based on at least one of the following: at least one prior utterance received from the customer, at least one prior response sent from the agent to the customer, and the knowledge base that comprises the information extracted from the at least one exemplary conversation.

3. (Original) A method as recited in Claim 2, wherein the at least one prior utterance received from the customer and the at least one prior response sent from the agent to the customer provide a contextual framework for analyzing the utterance received from the customer.

4. (Original) A method as recited in Claim 2, further comprising:

maintaining a conversation model having a current state that is representative of the at least one prior utterance received from the customer and the at least one prior response sent from the agent to the customer; and

updating the current state of the conversation model based on the utterance received from the customer and the response sent from the agent to the customer.

5. (Original) A method as recited in Claim 2, wherein analyzing the utterance received from the customer comprises at least one of the following:

recognizing the utterance received from the customer based on the knowledge base that comprises the information extracted from the at least one exemplary conversation; and

recognizing a part of the utterance received from the customer based on the knowledge base that comprises the information extracted from the at least one exemplary conversation.

6. (Original) A method as recited in Claim 5, wherein the utterance received from the customer comprises a plurality of data strings, and wherein recognizing the part of the utterance received from the customer comprises at least one of the following:

recognizing a sub-combination of the plurality of data strings based on the knowledge base that comprises the information extracted from the at least one exemplary conversation; and

recognizing one of the plurality of data strings based on the knowledge base that comprises the information extracted from the at least one exemplary conversation.

7. (Original) A method as recited in Claim 5, wherein recognizing the utterance received from the customer comprises associating the utterance received from the customer with an information type that corresponds to at least one of a predefined information arrangement and a predefined information meaning.

8. (Original) A method as recited in Claim 5, wherein recognizing the part of the utterance received from the customer comprises associating the part of the utterance received from the customer with an information type that corresponds to at least one of a predefined information arrangement and a predefined information meaning.

9. (Original) A method as recited in Claim 2, further comprising:

sending the utterance received from the customer and the response sent from the agent to the customer to a customer service representative.

10. (Original) A method as recited in Claim 9, wherein the at least one prior utterance received from the customer and the at least one prior response sent from the agent to the customer provide a contextual framework for analyzing the utterance
received from the customer, the method further comprising:

maintaining a conversation model at the agent having a current state that is representative of the at least one prior utterance received from the customer and the at least one prior response sent from the agent to the customer;

updating the current state of the conversation model based on the utterance received from the customer and the response sent from the agent to the customer; and

sending the current state of the conversation model to the customer service representative.

11. (Original) A method as recited in Claim 1, further comprising:

receiving a notification from a customer service representative of intent to communicate with the customer.

12. (Original) A method as recited in Claim 11, wherein generating the response to the utterance received from the customer comprises:

generating at least one response to the utterance received from the customer at the agent based on the knowledge base that comprises information extracted from the at least one exemplary conversation; and wherein sending the response from the agent to the customer comprises:

sending the at least one response to the customer service representative;

receiving a selection of one of the at least one response from the customer service representative at the agent; and

sending the selected one of the at least one response from the agent to the customer.

13. (Original) A method as recited in Claim 11, further comprising:

receiving a proposed response from the customer service representative at the agent;

determining if the proposed response is appropriate to send to the customer;

sending the proposed response to a supervisor for approval if the proposed response is determined to be inappropriate; and

sending the proposed response to the customer if the proposed response is determined to be appropriate.

14. (Original) A method as recited in Claim 1, further comprising:

recording the utterance received from the customer and the response sent from the agent to the customer in a conversation log.

15. (Original) A method as recited in Claim 14, further comprising:

reviewing the conversation log to determine if the agent sent an improper response to the customer; and

editing the conversation log to correct the improper response if the agent sent the improper response to the customer.

16. (Original) A method as recited in Claim 1, wherein generating the response to the utterance received from the customer comprises:

determining if the response to the utterance received from the customer can be generated at the agent based on the knowledge base that comprises information extracted from the at least one exemplary conversation; and

sending the utterance received from the customer to a customer service representative if the response cannot be generated at the agent based on the knowledge base that comprises information extracted from the at least one exemplary conversation; and

generating the response to the utterance received from the customer at the customer service representative.

17. (Previously presented) A method of training an agent to respond to a customer communication, comprising:

compiling at least one exemplary conversation, wherein the at least one exemplary conversation comprises an exchange of utterances;

annotating the compiled at least one conversation to categorize information contained therein;

processing the annotated at least one conversation using a machine learning engine to populate a knowledge base for use by the agent in generating a response to the customer communication.

18. (Original) A method as recited in Claim 17, wherein annotating the compiled at least one conversation comprises:

presenting a user with a plurality of categories for annotating the at least one conversation; and

associating respective ones of the plurality of categories with respective parts of the at least one conversation based on user input.

19. (Original) A method as recited in Claim 18, wherein parts of the utterances comprising the at least one conversation comprise sentences and words.

20. (Original) A method as recited in Claim 19, wherein presenting the user with the plurality of categories comprises:

presenting the user with a plurality of categories based on intent for annotating the sentences; and

presenting the user with a plurality of categories based on semantic content for annotating the words.

21. (Original) A method as recited in Claim 19, further comprising:

verifying that all words that are determinative to the meaning of utterances comprising the at least one conversation are annotated.

22. (Original) A method as recited in Claim 17, wherein the at least one conversation comprises a conversation in which the agent was a participant.

23. (Original) A system for responding to a customer communication, comprising:

means for receiving an utterance from the customer at an agent executing on a data processing system;

means for generating a response to the utterance received from the customer at the agent based on a knowledge base that comprises information extracted from at least one exemplary conversation, wherein the at least one exemplary conversation comprises an exchange of utterances; and

means for sending the response from the agent to the customer.

24. (Original) A system as recited in Claim 23, wherein the means for generating the response to the utterance received from the customer comprises:

means for analyzing the utterance received from the customer based on at least one of the following: at least one prior utterance received from the customer, at least one prior response sent from the agent to the customer, and the knowledge base that comprises the information extracted from the at least one exemplary conversation.

25. (Original) A system as recited in Claim 24, wherein the at least one prior utterance received from the customer and the at least one prior response sent from the agent to the customer provide a contextual framework for analyzing the utterance received from the customer.

26. (Original) A system as recited in Claim 24, further comprising:

means for maintaining a conversation model having a current state that is representative of the at least one prior utterance received from the customer and the at least one prior response sent from the agent to the customer; and

means for updating the current state of the conversation model based on the utterance received from the customer and the response sent from the agent to the customer.

27. (Original) A system as recited in Claim 24, wherein the means for analyzing the utterance received from the customer comprises at least one of the following:

means for recognizing the utterance received from the customer based on the knowledge base that comprises the information extracted from the at least one exemplary conversation; and

means for recognizing a part of the utterance received from the customer based on the knowledge base that comprises the information extracted from the at least one exemplary conversation.

28. (Original) A system as recited in Claim 27, wherein the utterance received from the customer comprises a plurality of data strings, and wherein the means for recognizing the part of the utterance received from the customer comprises at least one of the following:

means for recognizing a sub-combination of the plurality of data strings based on the knowledge base that comprises the information extracted from the at least one exemplary conversation; and

means for recognizing one of the plurality of data strings based on the knowledge base that comprises the information extracted from the at least one exemplary conversation.

29. (Original) A system as recited in Claim 27, wherein the means for recognizing the utterance received from the customer comprises means for associating the utterance received from the customer with an information type that corresponds to at least one of a predefined information arrangement and a predefined information meaning.

30. (Original) A system as recited in Claim 27, wherein the means for recognizing the part of the utterance received from the customer comprises associating the part of the utterance received from the customer with an information type that corresponds to at least one of a predefined information arrangement and a predefined information meaning.

31. (Original) A system as recited in Claim 24, further comprising:

means for sending the utterance received from the customer and the response sent from the agent to the customer to a customer service representative.

32. (Original) A system as recited in Claim 31, wherein the at least one prior utterance received from the customer and the at least one prior response sent from the agent to the customer provide a contextual framework for analyzing the utterance received from the customer, the system further comprising:

means for maintaining a conversation model at the agent having a current state that is representative of the at least one prior utterance received from the customer and the at least one prior response sent from the agent to the customer;

means for updating the current state of the conversation model based on the utterance received from the customer and the response sent from the agent to the customer; and

means for sending the current state of the conversation model to the customer service representative.

33. (Original) A system as recited in Claim 23, further comprising:

means for receiving a notification from a customer service representative of intent to communicate with the customer.

34. (Original) A system as recited in Claim 33, wherein the means for generating the response to the utterance received from the customer comprises:

means for generating at least one response to the utterance received from the customer at the agent based on the knowledge base that comprises information extracted from the at least one exemplary conversation; and wherein the means for sending the response from the agent to the customer comprises:

means for sending the at least one response to the customer service representative;

means for receiving a selection of one of the at least one response from the customer service representative at the agent; and

means for sending the selected one of the at least one response from the agent to the customer.

35. (Original) A system as recited in Claim 33, further comprising:

means for receiving a proposed response from the customer service representative at the agent;

means for determining if the proposed response is appropriate to send to the customer;

means for sending the proposed response to a supervisor for approval if the proposed response is determined to be inappropriate; and

means for sending the proposed response to the customer if the proposed response is determined to be appropriate.

36. (Original) A system as recited in Claim 23, further comprising:

means for recording the utterance received from the customer and the response sent from the agent to the customer in a conversation log.

37. (Original) A system as recited in Claim 36, further comprising:

means for reviewing the conversation log to determine if the agent sent an improper response to the customer; and

means for editing the conversation log to correct the improper response if the agent sent the improper response to the customer.

38. (Original) A system as recited in Claim 23, wherein the means for generating the response to the utterance received from the customer comprises:

means for determining if the response to the utterance received from the customer can be generated at the agent based on the knowledge base that comprises information extracted from the at least one exemplary conversation; and

means for sending the utterance received from the customer to a customer service representative if the response cannot be generated at the agent based on the knowledge base that comprises information extracted from the at least one exemplary conversation; and

means for generating the response to the utterance received from the customer at the customer service representative.

39. (Previously presented) A system for training an agent to respond to a customer communication, comprising:

means for compiling at least one exemplary conversation, wherein the at least one exemplary conversation comprises an exchange of utterances;

means for annotating the compiled at least one conversation to categorize information contained therein;

means for processing the annotated at least one conversation using a machine learning engine to populate a knowledge base for use by the agent in generating a response to the customer communication.

40. (Original) A system as recited in Claim 39, wherein the means for annotating the compiled at least one conversation comprises:

means for presenting a user with a plurality of categories for annotating the at least one conversation; and

means for associating respective ones of the plurality of categories with respective parts of the at least one conversation based on user input.

41. (Original) A system as recited in Claim 40, wherein parts of the utterances comprising the at least one conversation comprise sentences and words.

42. (Original) A system as recited in Claim 41, wherein the means for presenting the user with the plurality of categories comprises:

means for presenting the user with a plurality of categories based on intent for annotating the sentences; and

means for presenting the user with a plurality of categories based on semantic content for annotating the words.

43. (Original) A system as recited in Claim 41, further comprising:

means for verifying that all words that are determinative to the meaning of utterances comprising the at least one conversation are annotated.

44. (Original) A system as recited in Claim 39, wherein the at least one conversation comprises a conversation in which the agent was a participant.

45. (Original) A computer program product for responding to a customer communication, comprising:

a computer readable storage medium having computer readable program code embodied therein, the computer readable program code comprising:

computer readable program code for receiving an utterance from the customer at an agent executing on a data processing system;

computer readable program code for generating a response to the utterance received from the customer at the agent based on a knowledge base that comprises information extracted from at least one exemplary conversation, wherein the at least one exemplary conversation comprises an exchange of utterances; and

computer readable program code for sending the response from the agent to the customer.

46. (Original) A computer program product as recited in Claim 45, wherein the computer readable program code for generating the response to the utterance received from the customer comprises:

computer readable program code for analyzing the utterance received from the customer based on at least one of the following: at least one prior utterance received from the customer, at least one prior response sent from the agent to the customer, and the knowledge base that comprises the information extracted from the at least one exemplary conversation.

47. (Original) A computer program product as recited in Claim 46, wherein the at least one prior utterance received from the customer and the at least one prior response sent from the agent to the customer provide a contextual framework for analyzing the utterance received from the customer.

48. (Original) A computer program product as recited in Claim 46, further comprising:

computer readable program code for maintaining a conversation model having a current state that is representative of the at least one prior utterance received from the customer and the at least one prior response sent from the agent to the customer; and

computer readable program code for updating the current state of the conversation model based on the utterance received from the customer and the response sent from the agent to the customer.

49. (Original) A computer program product as recited in Claim 46, wherein the computer readable program code for analyzing the utterance received from the customer comprises at least one of the following:

computer readable program code for recognizing the utterance received from the customer based on the knowledge base that comprises the information extracted from the at least one exemplary conversation; and

computer readable program code for recognizing a part of the utterance received from the customer based on the knowledge base that comprises the information extracted from the at least one exemplary conversation.

50. (Original) A computer program product as recited in Claim 49, wherein the utterance received from the customer comprises a plurality of data strings, and wherein the computer readable program code for recognizing the part of the utterance received from the customer comprises at least one of the following:

computer readable program code for recognizing a sub-combination of the plurality of data strings based on the knowledge base that comprises the information extracted from the at least one exemplary conversation; and

computer readable program code for recognizing one of the plurality of data strings based on the knowledge base that comprises the information extracted from the at least one exemplary conversation.

51. (Original) A computer program product as recited in Claim 49, wherein the computer readable program code for recognizing the utterance received from the customer comprises computer readable program code for associating the utterance received from the customer with an information type that corresponds to at least one of a predefined information arrangement and a predefined information meaning.

52. (Original) A computer program product as recited in Claim 49, wherein the computer readable program code for recognizing the part of the utterance received from the customer comprises associating the part of the utterance received from the customer with an information type that corresponds to at least one of a predefined information arrangement and a predefined information meaning.

53. (Original) A computer program product as recited in Claim 46, further comprising:

computer readable program code for sending the utterance received from the customer and the response sent from the agent to the customer to a customer service representative.

54. (Original) A computer program product as recited in Claim 53, wherein the at least one prior utterance received from the customer and the at least one prior response sent from the agent to the customer provide a contextual framework for analyzing the utterance received from the customer, the computer program product further comprising:

computer readable program code for maintaining a conversation model at the agent having a current state that is representative of the at least one prior utterance received from the customer and the at least one prior response sent from the agent to the customer;

computer readable program code for updating the current state of the conversation model based on the utterance received from the customer and the response sent from the agent to the customer; and

computer readable program code for sending the current state of the conversation model to the customer service representative.

55. (Original) A computer program product as recited in Claim 45, further comprising:

computer readable program code for receiving a notification from a customer service representative of intent to communicate with the customer.

56. (Original) A computer program product as recited in Claim 55, wherein the computer readable program code for generating the response to the utterance received from the customer comprises:

computer readable program code for generating at least one response to the utterance received from the customer at the agent based on the knowledge base that comprises information extracted from the at least one exemplary conversation; and wherein the computer readable program code for sending the response from the agent to the customer comprises:

computer readable program code for sending the at least one response to the customer service representative;

computer readable program code for receiving a selection of one of the at least one response from the customer service representative at the agent; and

computer readable program code for sending the selected one of the at least one response from the agent to the customer.

57. (Original) A computer program product as recited in Claim 55, further comprising:

computer readable program code for receiving a proposed response from the customer service representative at the agent;

computer readable program code for determining if the proposed response is appropriate to send to the customer;

computer readable program code for sending the proposed response to a supervisor for approval if the proposed response is determined to be inappropriate; and

computer readable program code for sending the proposed response to the customer if the proposed response is determined to be appropriate.

58. (Original) A computer program product as recited in Claim 45, further comprising:

computer readable program code for recording the utterance received from the customer and the response sent from the agent to the customer in a conversation log.

59. (Original) A computer program product as recited in Claim 58, further comprising:

computer readable program code for reviewing the conversation log to determine if the agent sent an improper response to the customer; and

computer readable program code for editing the conversation log to correct the improper response if the agent sent the improper response to the customer.

60. (Original) A computer program product as recited in Claim 45, wherein the computer readable program code for generating the response to the utterance received from the customer comprises:

computer readable program code for determining if the response to the utterance received from the customer can be generated at the agent based on the knowledge base that comprises information extracted from the at least one exemplary conversation; and

computer readable program code for sending the utterance received from the customer to a customer service representative if the response cannot be generated at the agent based on the knowledge base that comprises information extracted from the at least one exemplary conversation; and

computer readable program code for generating the response to the utterance received from the customer at the customer service representative.

61. (Previously presented) A computer program product for training an agent to respond to a customer communication, comprising:

a computer readable storage medium having computer readable program code embodied therein, the computer readable program code comprising:

computer readable program code for compiling at least one exemplary conversation, wherein the at least one exemplary conversation comprises an exchange of utterances;

computer readable program code for annotating the compiled at least one conversation to categorize information contained therein;

computer readable program code for processing the annotated at least one conversation using a machine learning engine to populate a knowledge base for use by the agent in generating a response to the customer communication.

62. (Original) A computer program product as recited in Claim 61, wherein the computer readable program code for annotating the compiled at least one conversation comprises:

computer readable program code for presenting a user with a plurality of categories for annotating the at least one conversation; and

computer readable program code for associating respective ones of the plurality of categories with respective parts of the at least one conversation based on user input.

63. (Original) A computer program product as recited in Claim 62, wherein parts of the utterances comprising the at least one conversation comprise sentences and words.

64. (Original) A computer program product as recited in Claim 63, wherein the computer readable program code for presenting the user with the plurality of categories comprises:

computer readable program code for presenting the user with a plurality of categories based on intent for annotating the sentences; and

computer readable program code for presenting the user with a plurality of categories based on semantic content for annotating the words.

65. (Original) A computer program product as recited in Claim 63, further comprising:

computer readable program code for verifying that all words that are determinative to the meaning of utterances comprising the at least one conversation are annotated.

66. (Original) A computer program product as recited in Claim 61, wherein the at least one conversation comprises a conversation in which the agent was a participant.

APPENDIX B – EVIDENCE APPENDIX

None

APPENDIX C – RELATED PROCEEDINGS APPENDIX

None.